3.1.1.1.1 Social Cost of Greenhouse Gases*

The "social cost of carbon", "social cost of nitrous oxide", and "social cost of methane" – together, the "social cost of greenhouse gases" (SC-GHG) are estimates of the monetized damages associated with incremental increases in GHG emissions in a given year.

On January 20, 2021, President Biden issued E.O. 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. Section 1 of E.O. 13990 establishes an Administration policy to, among other things, reduce greenhouse gas emissions and bolster resilience to the impacts of climate change. Section 2 of the E.O. calls for Federal agencies to review existing regulations and policies issued between January 20, 2017, and January 20, 2021, for consistency with the policy articulated in the E.O. and to take appropriate action.

Consistent with E.O. 13990, the CEQ rescinded its 2019 "Draft National Environmental Policy Act Guidance on Considering Greenhouse Gas Emissions" and has begun review for updating its "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews" issued on August 5, 2016 (2016 GHG Guidance). While CEQ works on updated guidance, it has instructed agencies to consider and use all tools and resources available to them in assessing GHG emissions and climate change effects, including the 2016 GHG Guidance.

Regarding the use of Social Cost of Carbon or other monetized costs and benefits of GHGs, the 2016 GHG Guidance noted that NEPA does not require monetizing costs and benefits. It also noted that "the weighing of the merits and drawbacks of the various alternatives need not be displayed using a monetary cost-benefit analysis and should not be when there are important qualitative considerations."

Section 5 of E.O. 13990 emphasizes how important it is for federal agencies to "capture the full costs of greenhouse gas emissions as accurately as possible, including by taking global damages into account" and established an Interagency Working Group (IWG) on SC-GHG. In February of 2021, the IWG published Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide: Interim Estimates under Executive Order 13990 (IWG 2021). This is an interim report that updated previous guidance from 2016. The final report is expected in 2022.

On February 11, 2022, the U.S. District Court for the Western District of Louisiana issued an order that, in general, enjoined the Department of Interior, among other agencies, from taking action in connection with Section 5 of Executive Order 13990 and the "IWG" established by that Order relating to the measurement of SC-GHG. On March 16, 2022, the Fifth Circuit Court of Appeals stayed the injunction pending appeal (*Louisiana by & through Landry v. Biden*, No. 22-30087, 2022 WL 866282 [5th Cir. Mar. 16, 2022]), and this SEIS is including an analysis of the social cost of carbon pursuant to Executive Order 13990.

In accordance with this direction, this subsection provides estimates of the monetary value of changes in GHG emissions that could result from selecting each alternative. Such analysis should not be construed to mean a cost determination is necessary to address potential impacts of GHGs associated with specific alternatives. These numbers were monetized; however, they do not constitute a complete cost-benefit analysis, nor do the SC-GHG numbers present a direct comparison with other impacts analyzed in this document. SC-GHG is provided only as a useful measure of the benefits of GHG emissions reductions to inform agency decision-making.

For Federal agencies, the best currently available estimates of the SC-GHG are the interim estimates of the social cost of carbon dioxide, methane, and nitrous oxide developed by the IWG. Select estimates are published in the Technical Support Document (IWG 2021) and the complete set of annual estimates are available on the Office of Management and Budget's website .

The IWG's SC-GHG estimates are based on complex models describing how GHG emissions affect global temperatures, sea level rise, and other biophysical processes; how these changes affect society

Commented [ZH1]: GINA: New acronym. SC-GHG (social cost of greenhouse gases)

Commented [ZH2]: GINA: New acronym: IWG (Interagency Working Group on the Social Cost of Greenhouse Gases)

Commented [RA3]: GINA: Added reference. Citation as follows.

IWG. 2021. Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide. Interim Estimates under Executive Order 13990. February 2021. https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf

Commented [RA4]: GINA: Added reference. Citation provided above.

through, for example, agricultural, health, or other effects; and monetary estimates of the market and nonmarket values of these effects. One key parameter in the models is the discount rate, which is used to estimate the present value of the stream of future damages associated with emissions in a particular year. A higher discount rate assumes that future benefits or costs are more heavily discounted than benefits or costs occurring in the present (i.e., future benefits or costs are a less significant factor in present-day decisions). The current set of interim estimates of SC-GHG have been developed using three different annual discount rates: 2.5%, 3%, and 5% (IWG 2021).

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As expected with such a complex model, there are multiple sources of uncertainty inherent in the SC-GHG estimates. Some sources of uncertainty relate to physical effects of GHG emissions, human behavior, future population growth and economic changes, and potential adaptation (IWG 2021). To better understand and communicate the quantifiable uncertainty, the IWG method generates several thousand estimates of the social cost for a specific gas, emitted in a specific year, with a specific discount rate. These estimates create a frequency distribution based on different values for key uncertain climate model parameters. The shape and characteristics of that frequency distribution demonstrate the magnitude of uncertainty relative to the average or expected outcome.

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To further address uncertainty, the IWG recommends reporting four SC-GHG estimates in any analysis. Three of the SC-GHG estimates reflect the average damages from the multiple simulations at each of the three discount rates. The fourth value represents higher-than-expected economic impacts from climate change. Specifically, it represents the 95th percentile of damages estimated, applying a 3% annual discount rate for future economic effects. This is a low probability high damage scenario, which represents an upper bound of damages within the 3% discount rate model. The estimates below follow the IWG recommendations.

The SC-GHGs associated with estimated emissions from direct and indirect (domestic and foreign) emissions are provided in Table 3.2.7, while the SC-GHGs from the module delivery options are provided in Table 3.2.8. These estimates represent the present value of future market and nonmarket costs associated with CO_2, CH_4, and N_2O emissions. Estimates are calculated based on IWG estimates of social cost per metric ton of emissions for a given emissions year and BLM's estimates of emissions in each year.

The SC-GHGs under Alternative B would be generally lower than Alternatives C and D and higher than Alternative E; this ranking is largely driven by the corresponding differences in oil production between these alternatives.

Table 3.2.7. Social Cost of Greenhouse Gas Emissions (in thousands of 2020 US dollars) over Project Duration for Each Action Alternative*

Alternative	GHG Emissions Type	Average, 5%	Average, 3%	Average 2.5%	95th Percentile, 3%
B: Proponent's Project	Direct	$256,871	$1,028,898	$1,575,906	$3,134,773
B: Proponent's Project	Indirect Gross	$3,106,584	$12,009,025	$18,245,766	$36,498,292
B: Proponent's Project	Total Gross Domestic (Direct + Indirect)	$3,363,455	$13,037,923	$19,821,672	$39,633,065
B: Proponent's Project	Energy Sources Displaced by Project	$2,573,687	$9,947,290	$15,112,692	$30,231,253
B: Proponent's Project	Net Change from Baseline SC-GHG	$789,768	$3,090,633	$4,708,980	$9,401,812
B: Proponent's Project	Foreign	$746,075	$2,881,037	$4,376,202	$8,756,637
B: Proponent's Project	Total Net (Domestic Net + Foreign)	$1,535,843	$5,971,670	$9,085,182	$18,158,449
C: Disconnected Infield Roads	Direct	$281,046	$1,124,800	$1,722,547	$3,426,782
C: Disconnected Infield Roads	Indirect Gross	$3,106,584	$12,009,025	$18,245,766	$36,498,292

Alternative	GHG Emissions Type	Average, 5%	Average, 3%	Average 2.5%	95th Percentile, 3%
C: Disconnected Infield Roads	Total Gross Domestic (Direct + Indirect)	$3,387,631	$13,133,825	$19,968,313	$39,925,075
C: Disconnected Infield Roads	Energy Sources Displaced by Project	$2,573,687	$9,947,290	$15,112,692	$30,231,253
C: Disconnected Infield Roads	Net Change from Baseline SC-GHG	$813,943	$3,186,535	$4,855,621	$9,693,821
C: Disconnected Infield Roads	Foreign	$746,075	$2,881,037	$4,376,202	$8,756,637
C: Disconnected Infield Roads	Total Net (Domestic Net + Foreign)	$1,560,018	$6,067,572	$9,231,823	$18,450,458
D: Disconnected Access	Direct	$252,773	$1,021,782	$1,568,154	$3,115,269
D: Disconnected Access	Indirect Gross	$3,037,230	$11,858,094	$18,053,759	$36,087,469
D: Disconnected Access	Total Gross Domestic (Direct + Indirect)	$3,290,003	$12,879,875	$19,621,913	$39,202,739
D: Disconnected Access	Energy Sources Displaced by Project	$2,501,597	$9,765,204	$14,866,786	$29,717,377
D: Disconnected Access	Net Change from Baseline SC-GHG	$788,406	$3,114,672	$4,755,127	$9,485,361
D: Disconnected Access	Foreign	$761,802	$2,975,611	$4,530,705	$9,057,874
D: Disconnected Access	Total Net (Domestic Net + Foreign)	$1,550,208	$6,090,283	$9,285,832	$18,543,235
E: Four-Pad Alternative	Direct	$256,983	$1,029,780	$1,577,408	$3,137,747
E: Four-Pad Alternative	Indirect Gross	$3,037,858	$11,731,105	$17,819,481	$35,648,755
E: Four-Pad Alternative	Total Gross Domestic (Direct + Indirect)	$3,294,841	$12,760,885	$19,396,889	$38,786,502
E: Four-Pad Alternative	Energy Sources Displaced by Project	$2,496,258	$9,638,030	$14,639,548	$29,287,469
E: Four-Pad Alternative	Net Change from Baseline SC-GHG	$798,583	$3,122,855	$4,757,342	$9,499,034
E: Four-Pad Alternative	Foreign	$722,384	$2,785,772	$4,230,262	$8,465,532
E: Four-Pad Alternative	Total Net (Domestic Net + Foreign)	$1,520,966	$5,908,627	$8,987,604	$17,964,566

Table 3.2.8. Social Cost of Greenhouse Gas Emissions (in 2020 US dollars) over Project Duration for Module Delivery Options*

Module Transfer Options	Average, 5%	Average, 3%	Average, 2.5%	95th Percentile, 3%
Option 1: Atigaru Point MTI – All alternatives	$1,966,390	$7,081,888	$10,602,299	$21,300,211
Option 2: Point Lonely MTI – All alternatives	$4,778,420	$17,208,808	$25,763,201	$51,758,388
Option 3: Colville River Crossing – Alternatives B, C, and E	$554,242	$2,006,670	$3,007,095	$6,040,965
Option 3: Colville River Crossing – Alternative D	$598,059	$2,165,608	$3,245,354	$6,519,631

Notes: GHG (greenhouse gases); SC-GHG (Social Cost of Greenhouse Gases).